

GAIN OF FUNCTION MUTATIONS IN  
ATP-DEPENDENT TRANSPOSITION PROTEINS

ABSTRACT OF THE DISCLOSURE

5           The invention is specifically directed to efficient, random, simple insertion of a  
transposon or derivative transposable element into DNA *in vivo* or *in vitro*. The invention  
is particularly directed to mutations in ATP-utilizing regulatory transposition proteins that  
permit insertion with less target-site specificity than wild-type. The invention encompasses  
gain-of-function mutations in TnsC, an ATP-utilizing regulatory transposition protein that  
10    activates the bacterial transposon Tn $\underline{7}$ . Such mutations enable the insertion of a Tn $\underline{7}$   
transposon or derivative transposable element in a non-specific manner into a given DNA  
segment. Insertion can be effected in plasmid and cosmid libraries, cDNA libraries, PCR  
products, bacterial artificial chromosomes, yeast artificial chromosomes, mammalian  
artificial chromosomes, genomic DNAs, and the like. Such insertion is useful in DNA  
15    sequencing methods, for genetic analysis by insertional mutagenesis, and alteration of gene  
expression by insertion of a given genetic sequence.

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